

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 6, 7 and 9 remain under consideration. Claims 3 and 8 have been withdrawn from consideration. The Examiner is respectfully requested to reconsider his rejections in view of the amendments and remarks as set forth below.

Rejection Under 35 U.S.C. § 103

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being obvious over Ishikawa et al. (U. S. Patent 5,915,467) in view of Schuez et al. (U. S. Patent 5,775,411). This rejection is respectfully traversed.

The Examiner states that the Ishikawa et al. reference discloses all of the claimed limitations except for the secondary grooves. The Examiner relies on Schuez et al. to show a plurality of grooves 3 and projection portions 2 having secondary grooves 5 to improve heat exchange. Applicants disagree that claim 9 is obvious over this combination of references.

Regarding the Ishikawa et al. reference, Applicants disagree that the reference shows all of the claimed limitations except the secondary grooves. In particular, the Ishikawa et al. reference does show two rows of grooves having different widths, but does not show regions of V-shaped patterns. As is clearly seen in Figure 1, there is a section entitled "W3," which falls between the two rows W1 and W2, which does not have grooves. Thus, there can be no V-shaped patterns formed in this region. Further, it would not be obvious to include V-shaped patterns in the region because this

section is designed to be smooth. As indicated at column 6, lines 50-56, this region extends in the direction of the axis so that the flow of refrigerant is smooth with a reduced pressure loss. The claims have been amended to set forth a combination of elements wherein the corresponding grooves in the rows form individual V-shapes by their intersection. This is clearly not seen and, in fact, teaches against the Ishikawa et al. reference.

Concerning the Schuez et al. reference, the projections include indentations along part of the side surfaces of the projections. However, claim 9 sets forth a combination of elements wherein the secondary grooves are fine grooves having a small width compared to the radial direction of the projection portions. The radial direction is the height of the projection from the wall of the pipe. As seen in Figure 2 of Schuez et al., the indentations are not fine in the sense of being much smaller than this direction of the projection. Claim 9 has been amended to set forth a combination of elements wherein the secondary grooves have a small width compared to the radial direction of the projection portion. Also, the claim describes the secondary grooves as extended from one side surface of the projection to the other side surface. This does not occur with the indentations, which are formed on only a small section of both side surfaces, but do not extend from one to the other. They also do not extend the full height of the side surfaces as does the present claimed invention. Accordingly, Applicants submit that claim 9 is allowable over this combination of references.

Claims 6, 7 and 9 stand rejected under 35 U.S.C. § 103(a) as being obvious over Ishikawa et al. (JP 10-47880) or Sasaki et al. (JP 10-300379) in view of Schuez et al. This rejection is respectfully traversed.

The Examiner states that both Ishikawa et al. and Sasaki et al. show all of the claimed limitations except the secondary grooves. Applicants disagree with the Examiner's understanding of these references. The Sasaki et al. reference includes a straight groove 14 in the area between the plurality of rows 12, which does not have rows of grooves and is similar in this respect to the cited U. S. patent to Ishikawa et al. While the Japanese patent to Ishikawa et al. does not include a separate smooth area, the grooves in the adjoining sections do not meet to form V-sections. In the claims of the present application, a combination of elements are set forth wherein each set of corresponding grooves form individual V-shapes by their intersection. This is clearly not seen in the Japanese patent to Ishikawa et al. Accordingly, Applicants submit that neither the Ishikawa et al. nor Sasaki et al. references render obvious the subject matter as set forth in the claims.

The Examiner relies on Schuez et al. to show the secondary grooves. However, Applicants submit that each of these claims has now been further amended to bring out the differences of the claimed secondary grooves over the teachings of Schuez et al. Thus, as discussed above, the indentations of Schuez et al. are not fine grooves and do not have a small width compared to the radial direction of the projection. Also, the grooves do not extend from one side surface to the other side surface. Thus, Applicants submit that claims 6, 7 and 9 are not obvious over this combination of references.

No Prosecution History Estoppel

Claims 6, 7 and 9 have been amended to clarify the claimed subject matter. No prosecution history estoppel would apply to the interpretation of the limitations set forth in claims 6, 7 and 9 in

view of the fact that the subject matter has been continuously presented since the original filing date of the present application.

Conclusion

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone, or in combination. In view of this, reconsideration of the rejections and allowance of all the claims are respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert F. Gnuse (Reg. No. 27,295) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

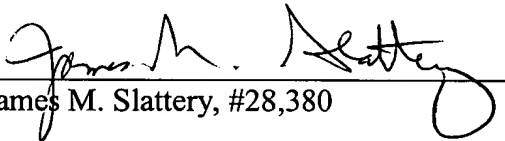
Pursuant to the provisions of 37 CFR 1.17 and 1.136(a), Applicant respectfully petitions for a one (1) month extension of time for filing a response in connection with the present application. The required fee of \$110.00 is attached hereto.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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